NATO'S CONCEPT FOR SPECTRUM SUPPORTABILITY

Mr. Russ Latimer

Deputy Division Chief, J65A

Joint Staff

Outline - NATO Spectrum Supportability (SS)

- Definitions
- NATO SS - GOAL
- NATO SS - PROCESS
- NATO SS - SUMMARY

Definitions Related to the NATO Process

- **Spectrum-Dependent Systems (SDS)** are those electronic systems, subsystems, devices and/or equipment that depend on the use of the electromagnetic spectrum for the acquisition and transfer of information. This includes ECM(1) systems, but not ESM(2) systems.

(1) Any sort of electrical or electronic device designed to trick or deceive radar, sonar, or other detection systems like IR (infrared) and Laser. It may be used both offensively or defensively in any method to deny targeting information to an enemy.

(2) Systems employed to detect, intercept, identify, locate, record, and/or analyze sources of radiated electromagnetic energy for the purposes of immediate threat recognition (such as warning that fire control RADAR has locked on a combat vehicle, ship, or aircraft) or longer-term operational planning

Definitions Related to the NATO Process (cont'd)

- **Signal Description (SD).** A set of parameters and values, which define the characteristics of an emission produced by a SDS; it includes [among other things] the **frequency band, modulation technique and associated bandwidth, duty cycle, and EIRP**.
- **Concept of Operations (CONOPS**): In the NATO Context, CONOPS refers only to the operational parameters having an impact on the usage of the spectrum, such as: **station class, number of equipments in given areas**.
- **Developing / Procuring Authority (DPA)** is a nation, organization or agency initiating and responsible for an acquisition or developmental program
- **Host Nations (HNs)** are those sovereign nations in which another nation or a NATO command / agency plans or is likely to conduct training, exercises or operations with the permission of that nation.

Definitions Related to the NATO Process (cont'd)

- **Host Nation Declaration (HND)** is the statement whether the spectrum supportability is granted, granted with restrictions, or not granted, received from authorities of sovereign nations after their review of the technical characteristics of a *signal description (SD)* or *spectrum-dependent system (SDS)*, and of the associated CONOPS, with regard of their national spectrum management policy, allocations, regulations, and technical standards. The HND may have to be reviewed during the life cycle of the SDS.
  - As decisions regarding the use of spectrum are sovereign and subject to change without notice a **HND does not have permanent validity** but rather, is subject to revisions.
  - A **positive HND never constitutes a promise of successful frequency assignment**, as the real assignment will depend on the availability of the spectrum at the time of the request.

NATO Spectrum Supportability - GOAL

- **Spectrum Supportability**. The goal of NATO spectrum supportability is to facilitate the timely provision of information leading to compatible systems that use the electromagnetic spectrum in support of national needs and NATO missions. It allows the DPA to assess, with a certain degree of confidence, whether the electromagnetic spectrum necessary to support the operation of a *SDS,* with its related *CONOPS*, is, or will be, available.

- **Within NATO and Partner nations, the complete SS cycle contains three steps**
  1. **Information Pull -** Consideration of anticipated *EME* for the *SDS / SD*
  2. **Information Push**
     a. Submission of a *SD* + *CONOPS* - Request for *HNDs* to the target *HNs*
     b. Registration of a *SDS*
  3. **Receipt and analysis of the *HNDs***

NATO Spectrum Supportability - PROCESS

Information Pull (e.g., EME Analysis)

- The process where developers / procurement agencies (*DPAs*) responsibly research existing information resources in an attempt to identify the best spectrum based on the combination of desired performance characteristics and potentially available spectrum / the best existing spectrum dependent technology to satisfy a capability gap.

Information Push

- **SD and CONOPS Submission**. The formal pushing of information (in SMADEF form) regarding a new/modified *SD and/*or *CONOPS* from a ***DPA,*** through FMSC (SMB), to the potential HNs. Each HN decides what type of information is important for making their decision; information pushed will always be the total received information, and each HN may filter out what it does not need (SMADEF being in XML form, a filter development becomes an easy task). The use of these national filters will allow HNs to view only the information desired, and ultimately assist in expediting the review process.

NATO Spectrum Supportability – PROCESS (Cont'd)

- **Information Push (Cont'd)**
  - **SDS Registration**. The process where a ***DPA*** registers a ***SDS***. In this stage, the DPA submits the SDS characteristics (linking to the registered SD / CONOPS) via SMADEF to SMB for posting in [the database]. Posting only makes the information available to be viewed as desired by the Alliance.

- **Host Nation Declarations (HNDs).** The process where host nations provide non-binding comments in response to a *DPA submission*, describing the likelihood of receiving host nation approval vis-à-vis an assignment. In some cases, HNDs may be negative due to existing constraints or foreseen changes to national spectrum usage.

NATO Spectrum Supportability – PROCESS (Cont'd)

- In all cases, HNDs should be exchanged from host nations to developing nations to allow seamless exchange and storage of the information, to be consulted in future supportability efforts or for support of other NATO spectrum management requirements.
- NARFAs cannot make long-term promises of access to their national spectrum. A "granted" declaration only constitutes a promise to attempt to provide spectrum.
- **When a HN has provided a HND for an SD and its associated CONOPS, this declaration will be applicable, until revised by the HN, to any piece of SDS which operates in conformity with this SD/CONOPS. Therefore any subsequent SDS using this SD will not need a submission but only an announcement.**
- Note: the SDS may additionally be capable of operating with non-standard-SD modes or outside of the related CONOPS; if it is intended to use the SDS in such modes, a complementary submission is necessary.

NATO Spectrum Supportability - SUMMARY

- **SUMMARY: NATO's Intent is to Declare Supportability by using a Signal Description (SD) + CONOPS**
  - **Signal Description (SD) is a set of parameters and values, which define the characteristics of an emission produced by a SDS; it includes *inter-alia* the frequency band, modulation technique and associated bandwidth, duty cycle, and EIRP.**
  - **Concept of Operations (CONOPS): In the NATO Context, CONOPS refers only to the operational parameters having an impact on the usage of the spectrum, such as: station class, number of equipments in given areas.**
- **When a HN has provided a HND for an SD and its associated CONOPS, this declaration will be applicable, until revised by the HN, to any piece of SDS which operates in conformity with this SD/CONOPS. Therefore any subsequent SDS using this SD will not need a submission but only an announcement.**